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1  /*
2  Display.cpp - A simple track GPS to SD card logger. Display module.
3  TinyTrackGPS v0.7
4
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24 */
25
26 #include "Display.h"
27
28 Display::Display(Display_Type t):_screen(t){
29     if (_screen == SDD1306_128X64){
30         _width = 16;
31         _height = 8;
32         _offset = 0;
33     } else if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C){
34         _width = 16;
35         _height = 2;
36         _offset = 0;
37     }
38 }
39
40 void Display::start(){
41     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C){
42         #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
43             // DEFINICION DE CARACTERES PERSONALIZADOS
44             byte alt[8] = {
45                 0b00000100,
46                 0b00001110,
47                 0b00011111,
48                 0b00000100,
49                 0b00000100,
50                 0b00000100,
51                 0b00000100,
52                 0b00000100,
53             };
54
55             byte ant[8] = {
56                 0b00001110,
57                 0b00010001,
58                 0b00010101,
59                 0b00010001,
60                 0b00000100,

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61         0b00000100,
62         0b00001110,
63         0b00000000,
64     };
65
66     byte sd[8] = {
67         0b00001110,
68         0b00010001,
69         0b00011111,
70         0b00000000,
71         0b00000000,
72         0b00010111,
73         0b00010101,
74         0b00011101,
75     };
76
77     byte hourglass_0[8] = {
78         0b00011111,
79         0b00001110,
80         0b00001110,
81         0b00000100,
82         0b00000100,
83         0b00001010,
84         0b00001010,
85         0b00011111,
86     };
87
88     byte hourglass_1[8] = {
89         0b00011111,
90         0b00001010,
91         0b00001110,
92         0b00000100,
93         0b00000100,
94         0b00001010,
95         0b00001010,
96         0b00011111,
97     };
98
99     byte hourglass_2[8] = {
100         0b00011111,
101         0b00001010,
102         0b00001110,
103         0b00000100,
104         0b00000100,
105         0b00001010,
106         0b00001110,
107         0b00011111,
108     };
109
110     byte hourglass_3[8] = {
111         0b00011111,
112         0b00001010,
113         0b00001010,
114         0b00000100,
115         0b00000100,
116         0b00001010,
117         0b00001110,
118         0b00011111,
119     };
120
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121     byte hourglass_4[8] = {
122         0b00011111,
123         0b00001010,
124         0b00001010,
125         0b00000100,
126         0b00000100,
127         0b00001110,
128         0b00001110,
129         0b00011111,
130     };
131     #endif
132     #if defined(DISPLAY_TYPE_LCD_16X2)
133     lcd = new LiquidCrystal(RS, ENABLE, D0, D1, D2, D3);
134     lcd->begin(_width, _height);
135     #elif defined(DISPLAY_TYPE_LCD_16X2_I2C)
136     lcd = new LiquidCrystal_I2C(I2C, _width, _height);
137     lcd->init();
138     lcd->backlight();
139     #endif
140
141     #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
142     lcd->createChar(0, hourglass_0);
143     lcd->createChar(1, hourglass_1);
144     lcd->createChar(2, hourglass_2);
145     lcd->createChar(3, hourglass_3);
146     lcd->createChar(4, hourglass_4);
147     lcd->createChar(5, alt);
148     lcd->createChar(6, ant);
149     lcd->createChar(7, sd);
150     #endif
151 }
152
153 if (_screen == SDD1306_128X64) {
154     #if defined(DISPLAY_TYPE_SDD1306_128X64)
155     u8x8_SSD1306 = new U8X8_SSD1306_128X64_NONAME_HW_I2C(U8X8_PIN_NONE, SCL,
SDA);
156     u8x8_SSD1306->begin();
157     u8x8_SSD1306->setFont(u8x8_font_7x14B_1x2_r);
158     #endif
159 }
160 }
161
162 void Display::clr(){
163     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
164         #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
165         lcd->clear();
166         #endif
167     }
168     else if (_screen == SDD1306_128X64) {
169         #if defined(DISPLAY_TYPE_SDD1306_128X64)
170         u8x8_SSD1306->clear();
171         #endif
172     }
173 }
174
175 void Display::print(int vertical, int horizontal, const char text[]){
176     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
177         #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
178         lcd->setCursor(vertical, horizontal);
179         lcd->print(text);

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180         #endif
181     }
182     else if (_screen == SDD1306_128X64) {
183         #if defined(DISPLAY_TYPE_SDD1306_128X64)
184             //u8x8_SSD1306->setCursor(vertical, (horizontal*2));
185             //u8x8_SSD1306->print(text);
186             u8x8_SSD1306->setCursor(vertical, (horizontal*2));
187             this->print(text);
188             //u8x8_SSD1306->display();
189         #endif
190     }
191 }
192
193 void Display::print(int line, const char text[]){
194     byte pos = _width -(strlen(text));
195     pos = (pos >> 1);
196     this->print((int)pos, line, text);
197 }
198
199 void Display::print(const char text[]){
200     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
201         #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
202             lcd->print(text);
203         #endif
204     }
205     else if (_screen == SDD1306_128X64) {
206         #if defined(DISPLAY_TYPE_SDD1306_128X64)
207             u8x8_SSD1306->print(text);
208             u8x8_SSD1306->flush();
209         #endif
210     }
211 }
212
213 void Display::print(const char text1[], const char text2[]){
214     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
215         this->print(0, text1);
216         this->print(1, text2);
217     }
218     else if (_screen == SDD1306_128X64) {
219         this->print(1, text1);
220         this->print(2, text2);
221     }
222 }
223
224 void Display::print(const char text1[], const char text2[], const char text3[]){
225     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
226         this->print(text1, text2);
227     }
228     else if (_screen == SDD1306_128X64) {
229         this->print(0, text1);
230         this->print(1, text2);
231         this->print(2, text3);
232     }
233 }
234
235 void Display::print(const char text1[], const char text2[], const char text3[],
236 const char text4[]){
237 }
238

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239 void Display::wait_anin(unsigned int t){
240     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
241         #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
242             lcd->setCursor(15,1);
243             lcd->write((byte)t%5);
244             #endif
245         }
246     else if (_screen == SDD1306_128X64) {
247         #if defined(DISPLAY_TYPE_SDD1306_128X64)
248             //char p = 0x2c;
249             //u8x8_SSD1306->drawString((t%16),6,"-");
250
251             uint8_t hourglass_UP[5][8] = { 0x01,0x1f,0x7f,0xff,0xff,0x7f,0x1f,0x01,
252                                             0x01,0x1f,0x7d,0xf9,0xf9,0x7d,0x1f,0x01,
253                                             0x01,0x1f,0x79,0xf1,0xf1,0x79,0x1f,0x01,
254                                             0x01,0x1f,0x71,0xe1,0xe1,0x71,0x1f,0x01,
255                                             0x01,0x1f,0x61,0x81,0x81,0x61,0x1f,0x01
256                                             };
257
258             uint8_t hourglass_DOWN[5][8] = {0x80,0xf8,0x86,0x81,0x81,0x86,0xf8,0x80,
259                                              0x80,0xf8,0xc6,0xe1,0xe1,0xc6,0xf8,0x80,
260                                              0x80,0xf8,0xe6,0xf1,0xf1,0xe6,0xf8,0x80,
261                                              0x80,0xf8,0xfe,0xf9,0xf9,0xfe,0xf8,0x80,
262                                              0x80,0xf8,0xfe,0xff,0xff,0xfe,0xf8,0x80
263                                              };
264             u8x8_SSD1306->drawTile((_width>>1)-1, 5, 1, hourglass_UP[t%5]);
265             u8x8_SSD1306->drawTile((_width>>1)-1, 6, 1, hourglass_DOWN[t%5]);
266             #endif
267         }
268     }
269
270 void Display::print_PChar(byte c) {
271     if (_screen == LCD_16X2 || _screen == LCD_16X2_I2C) {
272         #if defined(DISPLAY_TYPE_LCD_16X2) || defined(DISPLAY_TYPE_LCD_16X2_I2C)
273             lcd->write(c);
274             #endif
275         }
276     else if (_screen == SDD1306_128X64) {
277         #if defined(DISPLAY_TYPE_SDD1306_128X64)
278             uint8_t PChar_UP[3][8] = { 0x30,0x38,0x3c,0xff,0xff,0x3c,0x38,0x30,
279                                       0x3c,0x02,0x01,0xd9,0xd9,0x01,0x02,0x3c,
280                                       0x78,0x7c,0x6e,0x66,0x66,0x6e,0x7c,0x78
281                                       };
282             uint8_t PChar_DOWN[3][8] = { 0x00,0x00,0x00,0xff,0xff,0x00,0x00,0x00,
283                                          0x00,0xc0,0xe0,0xff,0xff,0xe0,0xc0,0x00,
284                                          0x7c,0xfc,0xc0,0xf8,0x7c,0x0c,0xfc,0xf8
285                                          };
286
287             if (c == 5) {
288                 u8x8_SSD1306->drawTile(9, 2, 1, PChar_UP[0]);
289                 u8x8_SSD1306->drawTile(9, 3, 1, PChar_DOWN[0]);
290             }
291             else if (c == 6) {
292                 u8x8_SSD1306->drawTile(11, 0, 1, PChar_UP[1]);
293                 u8x8_SSD1306->drawTile(11, 1, 1, PChar_DOWN[1]);
294             }
295             else if (c == 7) {
296                 u8x8_SSD1306->drawTile(15, 0, 1, PChar_UP[2]);
297                 u8x8_SSD1306->drawTile(15, 1, 1, PChar_DOWN[2]);
298             }
299             #endif
300         }
301     }

```

```
299     }
300 }
301
302 void Display::splash(int time_delay){
303     this->print(NAME, VERSION);
304     delay(time_delay);
305 }
```